60th Medical Group (AMC), Travis AFB, CA

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

FINAL REPORT SUMMARY

(Please type all information. Use additional pages if necessary.)

PROTOCOL #: FDG20150006A **DATE:** 31 July 2015

PROTOCOL TITLE: Treatment of Partial Thickness Burns with a Novel Extracellular Matrix in Rats (*Rattus norvegicus).*

PRINCIPAL INVESTIGATOR (PI) / TRAINING COORDINATOR (TC): Dr. J. Kevin Grayson

DEPARTMENT: CIF **PHONE #:** 423-5096

INITIAL APPROVAL DATE: 30 December 2014 **LAST TRIENNIAL REVISION DATE:** n/a

FUNDING SOURCE: SGO

1. **RECORD OF ANIMAL USAGE:**

Animal Species:	Total # Approved	# Used this FY	Total # Used to Date
Rattus norvegicus	54	50	50

2. **PROTOCOL TYPE / CHARACTERISTICS:** (Check all applicable terms in EACH column)

___ Training: Live Animal	___ Medical Readiness	___ Prolonged Restraint
___ Training: non-Live Animal	___ Health Promotion	___ Multiple Survival Surgery
_X_ Research: Survival (chronic)	___ Prevention	___ Behavioral Study
___ Research: non-Survival (acute)	___ Utilization Mgt.	___ Adjuvant Use
___ Other ( )	__X_ Other (Treatment)	___ Biohazard

3. **PROTOCOL PAIN CATEGORY (USDA):** (Check applicable) ___ C _X_ D ___ E

4. **PROTOCOL STATUS:**

***Request Protocol Closure:**

___ Inactive, protocol never initiated

___ Inactive, protocol initiated but has not/will not be completed

_X__ Completed, all approved procedures/animal uses have been completed

5. **Previous Amendments:**
List all amendments made to the protocol.. **IF none occurred, state NONE. Do not use N/A.**

For the Entire Study Chronologically

Amendment Number	Date of Approval	Summary of the Change
None		"Tab" to add rows.

6. **FUNDING STATUS:** Funding allocated: $10,175 Funds remaining: $0.00

7. **PROTOCOL PERSONNEL CHANGES:**

Have there been any personnel/staffing changes (PI/CI/AI/TC/Instructor) since the last IACUC approval of protocol, or annual review? ___ Yes _X_ No

If yes, complete the following sections (Additions/Deletions). For additions, indicate whether or not the IACUC has approved this addition.

ADDITIONS: (Include Name, Protocol function - PI/CI/AI/TC/Instructor, IACUC approval - Yes/No)

None

DELETIONS: (Include Name, Protocol function - PI/CI/AI/TC/Instructor, Effective date of deletion)

None

8. PROBLEMS / ADVERSE EVENTS: Identify any problems or adverse events that have affected study progress. Itemize adverse events that have led to unanticipated animal illness, distress, injury, or death; and indicate whether or not these events were reported to the IACUC.

Several rats died during the conduct of the protocol.

9. REDUCTION, REFINEMENT, OR REPLACEMENT OF ANIMAL USE:

REPLACEMENT (ALTERNATIVES): Since the last IACUC approval, have alternatives to animal use become available that could be substituted in this protocol without adversely affecting study or training objectives?

No.

REFINEMENT: Since the last IACUC approval, have any study refinements been implemented to reduce the degree of pain or distress experienced by study animals, or have animals of lower phylogenetic status or sentience been identified as potential study/training models in this protocol?

No.

REDUCTION: Since the last IACUC approval, have any methods been identified to reduce the number of live animals used in this protocol?

No.

10. PUBLICATIONS / PRESENTATIONS: (List any scientific publications and/or presentations that have resulted from this protocol. Include pending/scheduled publications or presentations).

None

11. Were the protocol objectives met, and how will the outcome or training benefit the DoD/USAF?

The protocol was successfully completed. The results suggest that the peritoneal extracellular matrix did not promote healing of partial thickness burns in rats.

12. PROTOCOL OUTCOME SUMMARY: (Please provide, in "ABSTRACT" format, a summary of the protocol objectives, materials and methods, results - include tables/figures, and conclusions/applications.)

Objectives: The objective this study was to examine the cellular and immune responses to Oasis™ extracellular matrix (ECM) made from swine small intestinal submucosa, Matristem™ ECM made from swine bladder submucosa, with a new ECM made from swine peritoneum, all in a rat burn model. The primary outcome measure was burn healing, defined as wound area remaining after four weeks.
Materials and Methods: Fifty male Sprague-Dawley rats were anesthetized and the skin over the withers was aseptically prepared. A 2-cm diameter partial thickness burn was produced using a brass scale weight. Groups of 10 rats were randomly assigned to the following treatments: control (Vaseline gauze only), Oasis ECM covered with Vaseline gauze, Matristem ECM covered with Vaseline gauze, mesothelium sheet covered with Vaseline gauze, and mesothelium powder covered with Vaseline gauze. Jackets made from bandaging material were then applied to protect the wound and rats were housed on sterile bedding. The rats were reanesthetized, wounds examined and dressings changed at weekly intervals for four weeks. The rats were sacrificed, digital images of the wounds were taken, and tissues were harvested for histopathology.
Results: Forty-three rats (86%) survived to sacrifice. Digital images from the wounds were measured in triplicate by an investigator blinded to treatment. Table 1 lists the findings.

Group	Mean Area (mm)	SD	Mean % Reduction
Control	191.9	59.7	38.9
Matristem	190.7	78.0	39.3
Oasis	175.6	46.5	44.1
Meso Sheet	220.5	98.0	29.8
Meso Powder	207.8	81.9	33.9

There was no significant difference between treatments in terms of mean wound area ($p = 0.77$). Oasis™ performed the best, but only slightly better than control. Mesothelium sheet performed the worst. Histologic examination revealed that all of the grafts were infected, with bacteria and polymorphonucleocyte infiltration. Conclusions: None of the extracellular matrices performed differently than the control treatment. However, infections likely interfered with wound healing and prevented assessment of graft infiltration. A different animal model will be needed to provide a complete evaluation of the cellular and immune response to these materials.

(Dr. J. Kevin Grayson)

4 July 15
(Date)

Attachments:
Attachment 1: Defense Technical Information Center (DTIC) Abstract Submission **(Mandatory)**

Attachment 1
Defense Technical Information Center (DTIC) Abstract Submission
This abstract requires a brief (no more than 200 words) factual summary of the most significant information in the following format: Objectives, Methods, Results, and Conclusion.

Objectives: The objective this study was to examine the cellular and immune responses to various extracellular matrices (ECM) in a rat burn model. The primary outcome measure was wound area remaining after four weeks.
Materials and Methods: Fifty male Sprague-Dawley rats were anesthetized. A 2-cm diameter partial thickness burn was produced using a brass scale weight. Groups of 10 rats were randomly assigned to the various treatments. Jackets made from bandaging material were then applied to protect the wound and rats were housed on sterile bedding. The rats were examined and dressings changed at weekly intervals for four weeks. Digital images of the wounds were taken, and tissues were harvested for histopathology.
Results: There was no significant difference between treatments in terms of mean wound area ($p = 0.77$). Histologic examination revealed that all of the grafts were infected, with bacteria and polymorphonucleocyte infiltration.
Conclusions: None of the extracellular matrices performed differently than the control treatment. However, infections likely interfered with wound healing and prevented assessment of graft infiltration. A different animal model will be needed to provide a complete evaluation of the cellular and immune response to these materials.

Grant Number:_____
From:_____
****If you utilized an external grant, please provide Grant # and where the grant came from. Thank you.**